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E-Library Resources and Services: Improvement and Innovation of Access and Retrieval for Effective Research Activities in University E-libraries in Kogi State Nigeria

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Introduction

University e-libraries have made research more interesting and have attained the status of intellectually organized information resource Centre and a world of knowledge at researchers' fingertips. Adoption of university e-library is a good match towards making researchers, students, faculty members and the university more research driven. The rationale for adoption of e-libraries in universities in Nigeria is solely to provide electronic and online resources for staff and students in order to enhance educational development and provide educational resources for effective teaching, learning and research activities. Electronic library achieves its objectives by creating opportunities for the users to access and retrieve appropriate information that cater for their information needs at their "beck and call". University e-library is responsible for providing instant access to digitized information, electronic information resources and services with the aid of computer or telecommunication technologies. Electronic library acquires, processes, stores, evaluates and disseminates information via electronic means to the audience in need of information. It can serve as a medium for achieving national and community development through provision of relevant information necessary for decision making and policy enhancement. Electronic library is a multi-disciplinary concept that shares various branches of computer science including data management, information retrieval, library science, document management, information systems, the web, image processing, and artificial intelligence. Multi-disciplinary nature of electronic library engenders flexibility in the definitions which makes it difficult to have a singular definition of e-library. However, the format, form and nature of digital libraries give clearer picture of what digital library means.

Electronic library is the library where some or all of the holdings of the library are available in electronic format, and the services of the library are also made available

electronically-frequently over the Internet so that users can access them remotely (Onwuchekwa and Jegede, 2011). According to Hirsh (2014), the mission of e-library is to provide both information services and resources that are capable of meeting the research, teaching and learning needs of the faculty and students. Of course, academic researchers see e-library as research Centre and intellectual energy house where knowledge, ideas and directions are generated to achieve research goals of the university.

Digital library provides library and information resources in electronic format other than print format and enhances searching of electronic collections distributed across networks, rather than merely creating electronic repositories from digitized physical materials. A digital library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The content may be stored locally, or accessed remotely (Arora, Trivedi and Kembhavi, 2013).

Daniel in Akpoghome and Jerome (2010) opine that the potential of e-library lies in its use of electronic wide area network in the library in which the users enjoy the euphoria of being in distance and still access library collection. The foregoing reveals that e-library eliminates physical boundaries of data storage, access, retrieval and dissemination of information to users within and across the globe with the use of internet network.

The Library of Congress Collections Policy Statements Supplementary Guidelines (2008) stressed that electronic resource are any work encoded and made available for access through the use of a computer. It includes electronic data available by remote access referring to the use of electronic resources via computer networks; and direct access (fixed media) referring to the use

of electronic resources via carriers (e.g. discs/disks, cassettes, cartridges) designed to be inserted into a computerized device or its auxiliary equipment.

Ugwu and Onyegiri (2013) clearly gave examples of electronic resources which include, but are not limited to: web sites, online databases, e-journals, e-books, electronic integrating resources, and physical carriers in all formats, whether free or fee-based, required to support research in the subject covered, and may be audio, visual, and/or text files. Similarly, Okore, Asogwa and Eke (2009) define electronic information resources as any information resource that is accessed via the internet including CD-ROMs. They further enlisted specific types of electronic information resources as consisting of electronic books (e-books), electronic journals (e-journal), and indexes, collections of journal articles, reference works, digital collections and databases. According to Ekere, Omekwu and Nwoha (2016), electronic information resources include World Wide Web; WIFI; search engines; online indexes; video CDs VSAT based Internet connectivity; online Library catalogue; online databases; portals; E-journals and E-books.

Services in e-library include the typical traditional library and information services and other global information services through computer and telecommunication system. Ekere, Omekwu and Nwoha (2016) showed the various services provided at digital library which include: online internet search services; e-mail services; online reference services; online cataloguing and classification service; customer care services; management of online databases; Subscription services; awareness and workshop services; Audio and video communication services; news groups/dialogue databases; electronic document delivery Services; Interoperability services; Technical training in ICT for staff and users; online inter-library

services; digitized finding aids such as online indexes and bibliographies and online cataloguing and classification services

Digital library has become an integral part of academic research activities. It provides academic researchers with electronic access to national and international scholarly journals. These journals span wide areas of natural and physical sciences, social sciences and humanities, and address a long-standing need of the university community for access to scholarly publications for effective research and development activities in the universities. Okerson (2009) posits that digital library is a place of hope and adventure for every sort of searcher after knowledge. It is a place where people and ideas meet and new ideas are ignited, making possible new relationships and new possibilities.

University e-library plays prominent roles in promoting research in academic through provision of wide arrays of researchable information resources, mechanized access and retrieval information system. Having all the research articles, abstracts, thesis, dissertation, conference proceedings, textbooks, index and other reference material, students and academic staff tend to produce a better and more quality research project timely and with relative ease. Impact of digital library on research according to Trivedi (2010) includes provision of access to large amounts of information to users wherever they are and whenever they need it, access to primary information sources, support multimedia content along with text network accessibility on Intranet and Internet, user-friendly interface, hypertext links for navigation, client-server architecture.

The role of e-library to research activities impacts significantly on nation's social and economic development. Report by World Bank (1998) states that generation and transmission of knowledge through research has long been recognized as an essential requirement for a country's long-term growth and competitiveness as well as for creating capacity to solve social and

academic problems. Research productivity of academic researchers in the institutions of higher learning is regarded as a yardstick for academic advancement. This assertion holds credence to the fact that academic institution is a centre for learning, discoveries, finding of solution to societal problems, national developments, cultural values and character molding. Therefore, the quality and number research publications of academic researcher reflect their research productiveness. Kendagor, Kosgei, Tuitoek and Chelangat (2012) opine that research activities of academic researchers in academic institutions is determined by the number and quality of articles published by the affiliated faculty. Research productivity in universities reflects the active engagements of academic researchers. Research productivity of academic researchers is the totality of publication output in terms of articles published in peer review journals, conference proceedings and book chapters aimed at contributing to the existing body of knowledge. The quality and quantity of research publications by the academic researchers in universities are essential for their performance evaluations, promotions, securing tenure or permanent appointment, research grants, status enhancement, recognition, and other benefits. Perhaps, to ensure effective research productivity in universities, academic researchers must make effective use of reliable information resources.

University e-library, according to Kesavan (2009) was adopted to increase access to resources and facilitate new research; mechanize conservation, preservation and add value to the collection of the parent organization; offer consistent access and retrieval of online resources, give flexibility, provide enhanced capabilities for analysis and manipulation of information or data and to “save the time of the users”; support e-learning and online research; supplement traditional print resources, and integrate multimedia library resources on a common platform; to increase productivity, and provide better service to users; to make collections accessible to

concurrent users; and to deliver a complete and complex round-the-clock set of aggregated information services irrespective of users' location.

The objective of university e-library is limited if access and retrieval of e-resources and services are ineffective. However, access to and retrieval of digital information resources has remained one area of growing concern for e-librarians. According to Taylor and Francis (2013) pointed out areas in which improvement and innovation are needed to facilitate access to and retrieval of e-resources. They suggested creation and adoption of metadata standards to signal how 'open' content is; improved identification of free articles in hybrid journals; permanence of access and reliable archiving for free content; comprehensive indexing of quality free resources by discovery systems; provision of usage statistics for free online content, consistent across publishers; improved integration of free content with link resolvers; development of a wider range of trusted repositories linking to free content; improved user interfaces for accessing library-surfaced content; more training and support in information literacy skills for students and faculty; development of metrics for evaluating impact of content on institutional performance.

Trivedi (2010) states that improved access to e-library resources enhances research activities, promotes efficient delivery of information economically to all users; encourages co-operative efforts in research resources, computing, and communication networks; strengthens communication and collaboration between and among academic researchers and take leadership role in the generation and dissemination of knowledge.

Statement of the Problem

University e-library has tremendously advanced research activities and academic excellence in universities by providing relevant information resources to the users. E-library collects stores and organizes information in digital form; promotes efficient delivery of information economically to all users; encourages co-operative efforts in research resource; using communication networks to strengthen communication and collaboration between or among academic researchers and plays key roles in the generation and dissemination of knowledge.

In spite the roles of electronic libraries, users of university e-library still face challenges in access and retrieval of e-resources and services which grossly affect effective research activities. If improvement and innovation for access and retrieval of e-resources and services are not put into consideration, the users of the library would be scared to patronize the e-library and that would culminate into low research output and falling standard of the university.

In university e-libraries in Kogi State, it appears that the e-resources and services have not been fully utilized as a result of access problem and retrieval difficulties which required improvement and innovation in other to sustain adequate patronage. Studies indicate that postgraduates and academic staff in universities in Kogi State utilize e-library for their research works but it is not empirically known the areas in which improvement and innovation are needed to enhance access and retrieval of research activities. It appears no study has yet been carried out on this topic and this gives rise to the present study.

Purpose of the Study

The general purpose of this study is to investigate e-library resources and services: improvement and innovation of access and retrieval for effective research activities in university e-libraries in Kogi State Nigeria. Specifically, the study intended to:

1. Identify e-library resources in university e-libraries in Kogi State.
2. Identify e-library services provided in university e-libraries Kogi State
3. Ascertain the level of user's satisfaction with the effectiveness of digital library resources in university e-libraries
4. Ascertain the level of user's satisfaction with the effectiveness of digital library services in university e-libraries in Kogi State
5. Determine the areas for improvement and innovation to enhance access to e-library resources?
6. Determine the areas for improvement and innovation to enhance information retrieval from e-library resources?

Research Questions

1. What are the e-library resources in your library?
2. What are the e-library services provided in your library?
3. What is the level of your satisfaction with the effectiveness of e-library resources in your e-library?
4. What is the level of your satisfaction with the effectiveness of e-library services in your libraries?
5. What are the areas for improvement and innovation to enhance access to e-library resources?

6. What are the areas for improvement and innovation to enhance information retrieval from e-library environment?

METHODOLOGY

The study adopted descriptive survey design. The total population of the study is 240. The population comprises e-library users making up of 15 postgraduate students and 35 academic staff of Salem University (SU) Lokoja; 70 postgraduate students and 60 academic staff of Kogi State University (KSU) Anyigba; and 60 academic staff of Federal University Lokoja, exclusive of its postgraduate students. No sample used for this study due to the manageable size of the population. Data for this research was obtained through a structured questionnaire. The questionnaire which was captioned “E-Library Resources and Services: Improvement and Innovation of Access and Retrieval for Effective Research Activities in Universities in Kogi State Nigeria (ERSIARERA)” was validated by three experts, each from the institutions under study. Data for this study was collected by the researcher himself with assistance of research assistants from the respective institutions under study. The respondents for the study included lecturers and postgraduate students of Salem University (SU) Lokoja, Kogi State University (KSU), Anyigba and only the lecturers of Federal University Lokoja (FUL) due to the fact that the university has no postgraduate programme as of the time the study was conducted. These are the only universities in Kogi state, North Central Nigeria and they all have excellent tradition in research. These universities have well established E-libraries with diverse e-resources and services to support research, teaching and learning activities of the university. Copies of the questionnaire, which contained six research questions and fifty two items were distributed to the respondents and collected on the spot while 100 percent return-rate was achieved. Data collected with questionnaire was analyzed using frequency tables and simple percentages

DATA PRESENTATION AND ANALYSIS

The results obtained from the 240 copies of the research questionnaire were analyzed using simple percentages and frequency tables numbered 1-8. **Note** the key to tables: (**SU** = Salem University, Lokoja; **KSU** = Kogi State University, Anyigba; **FUL** = Federal University Lokoja)

Table 1 Age distribution of Respondents

AGE	SU	KSU	FUL	Total	%
Below 30	3	18	6	27	11%
31 – 39	9	20	10	39	16%
40 – 49	11	62	30	103	43%
50 – up	27	30	14	71	30%
Total	50	130	60	240	100%

Table I presents the age distribution of the respondents. It shows that 43 percent of the respondents were in the 40 – 49 ages bracket while 30 percent were between the ages of 50 years and above. On the other hand, 16 percent were 31-39. Only 11 percent of the respondents were below 30 years. This shows that more than half of the respondents are young adults (40-49 years) followed by old adults of 50 years and above.

Table 2: Categories of respondents

Respondents	SU	KSU	FUL	Total	%
Postgraduate students	15	70	-	85	35%
Academic Staff	35	60	60	155	65%
Total	50	130	60	240	100%

Table 2 summarizes categories of the respondents. Postgraduate students and academic staff constituted the bulk of academic researchers in university e-libraries in Kogi state with 55 percent of postgraduate students and 65 percent of academic staff respectively.

Research Questions One: What are the digital library resources in your library?

Table 3: Percentage distributions of respondents on the available digital library resources

S/N	Digital Library Resources	SU	KSU	FUL	Total	%	R
1	Online databases	8	15	7	30	13%	1 st
2	Online Public Access catalogue	7	11	6	24	10%	2 nd
3	Electronic Journals	5	15	5	25	10%	2 nd
4	Wireless network	5	10	5	20	8%	3 rd
5	Electronic Books	5	10	5	20	8%	3 rd
6	Search Engines	6	6	6	18	8%	3 rd
7	Local Area Network (LAN)	2	10	5	17	7%	4 th
8	Online newspaper	3	9	5	17	7%	4 th
9	The world wide web (www)	2	8	4	14	6%	5 th
10	Online indexes and abstracts	3	6	4	13	5%	6 th
11	CD-ROM	4	6	1	11	5%	6 th
12	Institutional repository	0	6	3	9	4%	7 th
13	DVD-Rom	3	5	2	10	4%	7 th
14	Portals	1	5	2	8	3%	8 th
15	Audio resources	0	2	2	4	2%	9 th
	Total	54	124	62	240	100%	

Table 3 represents e-library resources of universities under study. The study revealed that online databases constitute (13%) of the digital resources of the libraries. Online Public Access Catalogue constituted (10%), electronic Journal (10%), wireless network (8%), electronic books (8%), search engines (8%), Local Area Network (7%), online newspapers (7%), the World Wide Web (6%), online indexes and abstracts (5%), CD-ROM (5%). Some digital library resources made it to the least percentage which include institutional repository (4%), DVD-Rom (4%), portal (3%) while audio resources are (2%).

Research Questions Two: What are the digital library services provided in your library?

Table 4: Percentage distributions of respondents on the available digital library services

S/N	Digital Library services	SU	KSU	FUL	Total	%	R
16	Information Literacy Services	5	16	7	28	12%	1 st
17	Online Internet Search services	6	11	6	23	10%	2 nd
18	Digitalization of Local contents	1	9	3	13	10%	2 nd
19	Electronic Document Delivery services	2	14	5	21	9%	3 rd
20	E-reference service	3	12	6	21	9%	3 rd
21	CD-Rom searching service	2	10	6	18	8%	4 th
22	Online inter-library services	10	5	2	17	7%	5 th
23	Technical training in ICT for staff and users	1	7	2	10	6%	6 th
24	Data management services	2	10	3	15	6%	6 th
25	Customer care services	5	10	8	14	6%	6 th
26	Awareness and workshop services	4	6	3	13	5%	7 th
27	Online cataloguing and classification services	4	5	2	11	5%	7 th
28	E-mail services	3	6	2	11	5%	7 th
29	Data Analysis services	2	8	3	13	5%	7 th
30	Audio/video Conferences	0	1	2	3	1%	8 th
Total		50	130	60	240	100%	

Table 4 indicates the major library services provided to satisfy the information needs of academic researchers in digital libraries of Universities in Kogi State Nigeria. These services include: information literacy services (12%) digitalization of local contents (10%), online internet search service (10 %), electronic document delivery services (9%), e-reference services (9%), CD-Rom searching service (8%), online inter-library service (7%), technical training in ICT for staff and users (6%), data management services (6%). Customer care services (6%) The following services scored 5% each and they include: awareness and workshop services, online cataloguing services, e-mail services and data analysis services while audio/ video conference services scored 1%.

Research Questions Three: What is the level of your satisfaction with the effectiveness of digital library resources?

Table 5: Percentage distributions of respondents on the researchers' satisfaction with the efficiency of digital library resources

S/N	Responses	SU	KSU	FUL	Total	%	R
31	Satisfied	21	60	30	111	46%	2 nd
32	Dissatisfied	25	65	28	118	49%	1 st
33	Undecided	4	5	2	11	5%	3 rd
	Total	50	130	60	240	100%	

Respondents in the above table were asked to indicate their level of satisfaction with the digital library resources under study. 118 respondents constituting 49% indicated dissatisfaction; 111 respondents making up 46% indicated satisfaction while 11 respondents constituting 5% were undecided.

Research Questions Four: What is the level of your satisfaction with the effectiveness of digital library services?

Table 6: Percentage distributions of respondents on the researchers' satisfaction with the efficiency of digital library services

	Responses	SU	KSU	FUL	Total	%	R
34	Satisfied	25	61	30	116	48%	2 nd
35	Dissatisfied	24	65	28	117	49%	1 st
36	Undecided	1	4	2	7	3%	3 rd
	Total	50	130	60	240	100%	

Respondents in the above table were asked to indicate their level of satisfaction with the digital library services under study. 117 respondents constituting 49% indicated dissatisfaction; 116

respondents making up 48% indicated satisfaction while 7 respondents constituting 3% were undecided.

Research Question Five: What are the areas for improvement and innovation to enhance access to digital library resources?

Table 7: Percentage distributions of respondents on the areas for improvement and innovation to enhance access to digital library resources.

S/N	Improvement and innovation of SU resources	SU	KSU	FUL	Total	%	R	R
37	Information literacy training for academic researchers	6	16	6	28	12%	1 st	1
38	Search engines to index sources	5	16	7	28	12%	1 st	1
39	Comprehensive indexing of impact factor journals	7	13	8	28	12%	1 st	1
40	Creation of metadata standards for description of digital contents	8	13	8	29	12%	1 st	1
41	Development of wider institutional repositories	5	15	6	26	11%	2 nd	2
42	Development of metrics for evaluating impact factor contents for local publications	6	15	6	27	11%	2 nd	2
43	Development of online user guideline for accessing e-resources	4	11	5	20	8%	3 rd	3
44	Provision of usage statistics for online content	3	11	4	18	8%	3 rd	3
45	Identification of free online articles in e-journals	4	10	6	20	8%	3 rd	3
46	Improved user interfaces for accessing library-surfaced content	2	10	4	16	7%	4 th	4
Total		50	130	60	240	100%		

Analysis data from the above table reveals the areas in which improvement and innovation is needed to enhance access to digital library resources. Respondents indicated the major areas which include: Information literacy training for academic researchers (12%); Search engines to index sources (12%); comprehensive indexing of impact factor journals (12%); creation of metadata standards for description of digital contents (12%); Development of wider institutional repositories (11%); development of metrics for evaluating impact factor contents for local publications (11%); development of online user guideline for accessing e-resources (8%); provision of usage statistics for online content (8%); identification of free online articles in e-journals (8%) while improved user interfaces for accessing library-surfaced content constituted (7%).

Research Question Six: What are the areas for improvement and innovation to enhance information retrieval from digital library environment?

Table 8: Percentage distributions of respondents on the areas for improvement and innovation to enhance information retrieval from digital library environment

S/N	Improvement and innovation of services	SU	KSU	FUL	Total	%	R	R
47	Training and support of users in information retrieval skills.	12	25	11	48	20%	1st	1
48	Building an index from a document collection to searchable data structure to enhance electronic information retrieval.	10	21	11	42	18%	2nd	2
49	Developing an improved descriptive metadata to describe information that is in formats other than text (e.g. image, map, animation etc)	8	21	10	39	16%	3 rd	3
50	Provision of online abstract that provides comprehensive information on the institutional repository	6	24	9	39	16%	3rd	3
	Provision of catalogues that provides	6	19	10	35	15%	4th	

51	comprehensive bibliographic information that cannot be derived directly from the objects.								4
52	Provision of more proficient digital librarians	8	20	9	37	15%	4th		
Total		50	130	60	240	100%			

Analysis of data from the above table revealed the areas in which improvement and innovation is needed to enhance information retrieval from digital library environment. Respondents indicated the major areas which include training and support of users in information retrieval skills (20%); building an index from a document collection to searchable data structure to enhance electronic information retrieval (18%); developing an improved descriptive metadata to describe information that is in formats other than text (e.g. image, map, animation etc (16%); provision of online abstracts that provides comprehensive information on the institutional repository (16%); provision of catalogues that provides comprehensive bibliographic information that cannot be derived directly from the objects (15%) ; and Provision of more proficient digital librarians (15%)

Discussion of Findings

This study shows in *Table 1* that academic researchers between the age of 40-49 are the major users of digital libraries for research purposes in universities in Kogi State Nigeria followed by the older adults from the age of 50 years and above. It is obvious from *Table 2* that most of these respondents are both postgraduate students who are also academic staff of the universities. In academic society where there is traditional of slogan “either you publish or you perish” continuous research and publication remain the predominant engagement of academic staff. According to Arora, Trivedi and Kembhavi (2013), the quality and number of published

research articles are regarded as a measure of success for academic researchers and academic institutes.

Table 3 shows the digital resources that are available in digital libraries in universities in Kogi State. This includes: electronic Journals, online databases, Online Public Access Catalogue, wireless network, search engines, electronic books, Local Area Network (LAN), the World Wide Web (www) and online newspapers CD-ROMs and online indexes and abstracts. These libraries lack institutional repository, DVD-Rom and official portals.

Table 4 indicates the major e-library services provided by university e-libraries in Kogi State Nigeria. These services include: information literacy services, digitalization of local contents, online internet search service, electronic document delivery services, e-reference services, CD-ROM searching service, online inter-library service, technical training in ICT for staff and users, data management services, customer care services, awareness and workshop services, online cataloguing services, e-mail services and data analysis services while audio/ video conference services is not available in these e-libraries.

Respondents in this study in **Table 5 and Table 6** expressed utter dissatisfaction with the digital resources and information services provided in the various university e-libraries in Kogi State.

It is also noteworthy that at the time of this research, none of the university e-libraries in Kogi State Nigeria provides audio/video conference services.

Table 7 shows the areas in which improvement and innovation is needed to enhance access to digital library resources which include: information literacy training for academic researchers, search engines to index sources, comprehensive indexing of impact factor journals, creation of metadata standards for description of digital contents, development of wider institutional repositories, development of metrics for evaluating impact factor contents for local publications,

development of online user guideline for accessing e-resources, provision of usage statistics for online content, identification of free online articles in e journals and improved user interfaces for accessing library-surfaced content constituted.

In agreement with the respondents' opinion, Taylor and Francis (2013) opine that improvement and innovation for effective access to free online resources are needed in the area of metadata standards to signal how 'open' content is; identification of free articles in hybrid journals; permanence of access and reliable archiving for free content; indexing of quality free resources by discovery systems; usage statistics for free online content, consistent across publishers; integration of free content with link resolvers; repositories linking to free content; user interfaces for accessing library-surfaced content; more training and support in information literacy skills for students and faculty and metrics for evaluating impact of content on institutional performance.

In similar vein, respondents in this study suggested in *Table 8* the areas in which improvement and innovation are needed to enhance information retrieval in university e-libraries include: training and support of users in information retrieval skills, building an index from a document collection to searchable data structure to enhance electronic information retrieval, developing an improved descriptive metadata to describe information that is in formats other than text (e.g. image, map, animation etc, provision of online abstracts that provides comprehensive information on the institutional repository, provision of catalogues that provides comprehensive bibliographic information that cannot be derived directly from the objects and provision of more proficient digital librarians. Improvement in the above mentioned areas will help users in retrieving information with less stress and therefore encourage research activities in university e-libraries in Kogi State.

CONCLUSION AND RECOMMENDATIONS

University e-libraries are adopted to complement university conventional libraries in providing students, faculty staff, academic researchers and members of university community with equal access to relevant information in digital formats without discrimination and at no cost to the patrons. Though many resources and services are provided, the analysis on *Table V and Table VI* leaves no doubts about the dissatisfactory nature of e-library resources and services of university e-libraries in Kogi State Nigerian. The prevailing state of these e-libraries in the area of information resources and services reflects in the overwhelming majority of the respondents 118 (49%) that were dissatisfied with the digital library resources and 117 respondents constituted (49%) who were dissatisfied with the digital library services in universities in Kogi State Nigeria . Considering the pivotal position of the e-library in academic research of the university, respondents acknowledged areas for improvement and innovation to enhance access to/retrieval of e-library resources. Based on the findings, the following recommendations were made by the researcher:

1. Federal Ministry of Education and other agencies should support the university libraries financially to enable them acquire e-library resources that will meet academic researchers' information needs.
2. The universities should enhance and upgrade the e-library resources and services to facilitate access and retrieval of information.
3. There should be regular training of e-library users on information retrieval skills
4. There should be employment of qualified digital librarians

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